

## REMARKS

The above Amendments and these Remarks are in reply to the Office Action mailed October 8, 2003. Claims 1-39 were pending in the Application prior to the outstanding Office Action. Mistakenly, two claims were originally numbered as 36. Accordingly, the second claim that was numbered 36 has been removed and added as new claim 40. New claim 41 has also been added. Claims 3, 10, 16 and 35 are canceled. Claims 1, 2, 4-8, 11-15, 19-21, 29, 30 and 34 are amended. Claims 1, 2, 4-9, 11-15, 17-34 and 36-41 remain for the Examiner's consideration. Reconsideration and withdrawal of the rejections is respectfully requested.

Claims 1-39 were rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over *Lee* (U.S. Patent No. 4,789,801). Claims 1-39 were also rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over *Sakakibara et al.* (U.S. Patent No. 4,643,745).

It is admitted in the Office Action that the "first electrodes" in *Lee*, as well as in *Sakakibara*, are not slack, curved, or coiled. However, it is asserted in the Office Action that these specific configurations of electrodes are a matter of design choice that would have been obvious to one of ordinary skill in the art, at the time the invention was made. It is further asserted that the first electrode in *Lee*, as well as in *Sakakibara*, would work equally well whether straight, curved, coiled, or slack, because the electrodes emit ions from their surface. It is also asserted in the Office Action that Applicants did not disclose the advantage of electrodes having these particular configurations over other configurations. Applicants respectfully disagree with the above assertions, and traverse the 103(a) rejections.

Claim 1, as amended, states that " said first electrode is one of (1) slack, (2) curved, and (3) coiled and spans a distance, and wherein said first electrode has a length that is at least fifteen percent greater than said distance."

As stated in paragraph [0133] on page 38 of the specification, "[i]n general, the quantity of negative ions generated and emitted by the first electrode is proportional to the surface area of the first electrode." As further explained in paragraph [0133], for a given electrode height, the length of a curved or slack wire emitter electrode is greater (e.g., 15-30% greater) than a straight electrode of the same height (i.e., spanning the same distance). In discussing FIG. 13A in paragraph [0133], the specification states that "[t]he greater total length of the electrode 252 translates to a larger surface area than the [straight] wire-shaped electrodes 232. Thus, the electrodes 252 will generate and emit more ions than the [straight] electrode 232. Ions emitted by the first electrode array attach to the particulate matter within the airflow. The charged particulate matter is attracted to, and collected by, the oppositely charged second collector plates 242. Since the electrodes 252 generate and emit more ions than the previously described [straight] electrodes 232, more particulate matter will be removed from the air."

Paragraph [0135] on page 39 of the specification explains that a coiled first electrode is also longer than a straight (i.e., taught) electrode, possibly even multiple times longer. In discussing FIG. 13C, in paragraph [0135], it is explained the "the electrodes 256 have a larger surface area than the [straight] electrodes 232, and generate and emit more ions than the [straight] first electrodes 232." For the same reasons just explained above, since the coiled electrodes generate and emit more ions than the straight (i.e., taught) electrodes, more particulate matter should be removed from the air.

Applicants respectfully disagree with the Examiner's broad assertion that the use of curved, slack or coiled electrodes is merely an obvious matter of design choice. Further, based on at least on the above discussed portions of the specification, Applicants respectfully disagree the assertion that Applicants did not disclose the advantages of electrodes having the

particular claimed configurations over other configurations. Rather, as shown above, the specification explains that a first electrode that is slack, has curves, or is coiled is longer than an straight (i.e., taught) electrode of the same height, thereby emitting more ions, and enabling more particulate matter to be removed from the air. For at least the reasons discussed above, Applicants believe that claim 1 is patentable over Lee and Sakakibara.

In the Third Information Disclosure Statement (IDS) submitted herewith, Applicants have submitted pictures of a portion of Trion's Console 250 Electronic Air Cleaner (referred to hereafter as "the Trion 250"). For the convenience of the Examiner, a copy of these pictures are attached to this Response (as well as included with the Third IDS). Although it may be difficult to see in the pictures, the Trion 250 includes emitter wires that are slightly scalloped, rather than completely straight. In the Trion 250, the distance that the emitter wires span is about 15 inches. Applicants' representative has removed one of the scalloped emitter wires from the Trion 250 and pulled it (i.e., stretched it) until it was substantially straight. The emitter wire's length when straightened was only about 15  $\frac{1}{4}$  inches. In other words, the length of the scalloped emitter wire is only about  $\frac{1}{4}$  inch longer than the distance that the wire spans, which is less than 2 percent greater than the distance that the wire spans. In summary, the scalloped emitter wire in the Trion 250 spans a distance of about 15 inches, and the length of the scalloped emitter wire (about 15  $\frac{1}{4}$  inches) is less than 2 percent greater than the distance (of about 15 inches) that the wire spans.

In contrast, claim 1 requires that "said first electrode is one of (1) slack, (2) curved, and (3) coiled and spans a distance, and wherein said first electrode has a length that is at least fifteen percent greater than said distance." The reason for making the length of the first electrode at least fifteen percent greater than the distance it spans is so that a substantially larger surface area is provided (as compared to a straight electrode), which will generate and emit significantly more

ions (than a straight electrode spanning the same distance), which in turn should cause more particulate matter to be removed from the air.

It is believed that providing a first electrode that has a length of at least fifteen percent greater than the distance that the first electrode spans (as required by claim 1) will provide substantially more ion emissions, and thus cause more particulate matter to be removed from the air, as compared to a slightly scalloped wire electrode as in the Trion 250, which is less than two percent greater than the distance that the wire electrode spans. Further, Applicants do not believe that one of ordinary skill in the art observing the scalloped wire electrode in the Trion 250 would be motivated to increase the scalloped wire electrode's length such that it is at least fifteen percent greater than the distance that it spans. This is because it does not appear that the motivation for providing a scalloped electrode in the Trion 250 was to increase ion emissivity. If the motivation for scalloping the wire electrodes in the Trion 250 were to increase ion emissivity, the length of scalloped electrodes would likely be more than a mere 1.7 % greater than the distance that the scalloped wire electrodes span. Rather, possible reason that the wire electrodes in the Trion 250 are slightly scalloped is because the wire used to form the electrodes may have been spooled (i.e., stored on spools) prior to being installed in the Trion 250, causing the wires to maintain some of their shape from when they were spooled.

For at least the reasons discussed above, Applicants believe that claim 1 is patentable over the Trion 250.

In view of the above, Applicants respectfully request that the Examiner reconsider and withdraw the 103(a) rejection of claim 1. Dependent claims 17, 18 and 22-28 depend from and add additional features to claim 1. Applicants assert that these dependent claims are patentable

over the applied references for at least the reasons that they depend from claim 1, as well as for the features that they add.

Claim 2, as amended, states that wherein said first electrode "is slack and spans a distance, and wherein said first electrode has a length that is at least fifteen percent greater than said distance." For reasons similar to those discussed above with reference to claim 1, Applicants respectfully assert that claim 2, as well as its dependent claim 4, are patentable.

Claim 5, as amended, states that "wherein said first electrode is a coil and spans a distance, and wherein said first electrode has a length that is at least fifteen percent greater than said distance." For reasons similar to those discussed above with reference to claim 1, Applicants respectfully assert that claim 5, as well as its dependent claims 6 and 7, are patentable.

Claim 8, as amended, states that "wherein said first electrode has a plurality of curves and spans a distance, and wherein said first electrode has a length that is at least fifteen percent greater than said distance." For reasons similar to those discussed above with reference to claim 1, Applicants respectfully assert that claim 8, as well as its dependent claim 9, are patentable.

Claim 11, as amended, includes a "first means for providing an electrode sufficiently slack, curved or coiled such that its length is at least fifteen percent greater than a distance that said first electrode spans." As explained in detail above, there are significant advantages using a significantly lengthened electrode, as compared to a shorter (i.e., straight or slightly scalloped)

electrode. These include emitting more ions, and enabling more particulate matter to be removed from the air. For at least these reasons, Applicants respectfully assert that claim 11 is patentable.

Claim 12, as amended, includes a "first electrode being first electrode being slack so that its length is at least fifteen percent greater than said distance that said first electrode spans, in order to enhance emissivity." For reasons similar to those discussed above with reference to claim 1, Applicants respectfully assert that claim 12 is patentable.

Claim 13 states that " said first electrode including a plurality of curves that cause its length to be at least fifteen percent greater than said distance in order to enhance emissivity." For reasons similar to those discussed above with reference to claim 1, Applicants respectfully assert that claim 13 is patentable.

Claim 14 states that "said first electrode being coiled so that its length is at least fifteen percent greater than the distance that said first electrode spans, in order to enhance emissivity." For reasons similar to those discussed above with reference to claim 1, Applicants respectfully assert that claim 14 is patentable.

Claim 15 states includes the step of "providing a first electrode that is sufficiently slack, curved or coiled such that its length is at least fifteen percent greater than a distance that said first electrode spans." For reasons similar to those discussed above with reference to claim 1, Applicants respectfully assert that claim 15, as well as its dependent claims 16 and 19, are patentable.

Claim 20 states that "said first electrode is one of (1) slack, (2) has curves, and (3) is coiled." For reasons similar to those discussed above with reference to claim 1, Applicants respectfully assert that claim 20 is patentable.

Claim 21 includes a "a first means for providing a first electrode having a length that is at least fifteen percent greater than a distance that the first electrode spans." For reasons similar to those discussed above with reference to claims 1 and 11, Applicants respectfully assert that claim 21, as well as its dependent claims 37-39, are patentable.

Claim 29 includes "a first electrode that spans a distance within said housing, said first electrode created from a wire-shaped element, and formed into a coil-shape such that a length of said electrode is at least fifteen percent greater than said distance." For reasons similar to those discussed above with reference to claim 1, Applicants respectfully assert that claim 29, as well as its dependent claims 30-33, are patentable.

Claim 34 includes a "a first electrode that spans a distance within said housing, said first electrode created from a wire shaped element, and formed into a curved configuration such that a length of said electrode is at least fifteen percent greater than said distance." For reasons similar to those discussed above with reference to claim 1, Applicants respectfully assert that claim 34, as well as its dependent claims 36 and 40, are patentable.

Newly added claim 41 states that "said first electrode has a plurality of curves that cause a length of said first electrode to be longer than said distance, said plurality of curves being in a same plane, said plane being parallel to said substantially flat surfaces of said second electrodes." In contrast, the scalloped wire electrodes in the Trion 250 are not all in a same plane, which is parallel to substantially flat surfaces of second electrodes.

In light of the above, it is respectfully requested that all outstanding rejections be reconsidered and withdrawn. The Examiner is respectfully requested to telephone the undersigned if he can assist in any way in expediting issuance of a patent.

The Commissioner is authorized to charge any underpayment or credit any overpayment to Deposit Account No. 06-1325 for any matter in connection with this response, including any fee for extension of time, which may be required.

Respectfully submitted,

Date: 1/6/04

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Trion Console 250  
(\*February 2000)

Following are some photographs and web literature relating to the Trion Console 250 Electronic Air Purifier.

The photographs are specifically of the collector cell (part number 422167) portion of the Trion Console 250. As can be seen in the photographs, the collector cell includes scalloped wire electrodes, which are discussed in the accompanying Response. Because they are very thin, the scalloped wire electrodes were difficult to photograph. Accordingly, a piece of white paper was placed under the three of the scalloped wire electrodes, so that they are observable in the photographs.

Photograph A is a perspective view of the collector cell with filter portions removed. Photograph B is a slight blow-up of Photograph A. Photograph C is a further blow-up of a portion of Photograph A. Photograph D is a more direct view of the collector cell with the filter portions removed.

\* Applicants do have an exact date for the Trion Console 250, but based on the web testimonials attached hereto, it appears to date back to at least February 2000. Applicants are also not sure whether the collector cell, for which the pictures are included, has changed since the Trion Console 250 was originally introduced. Thus, Applicants reserve the right to provide further details about relevant dates in the future, if necessary.



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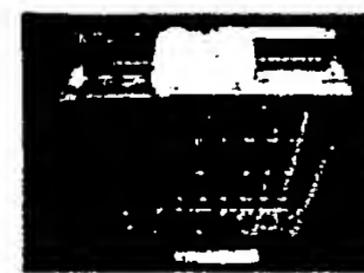
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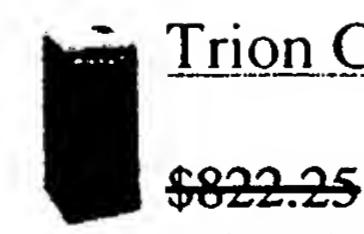
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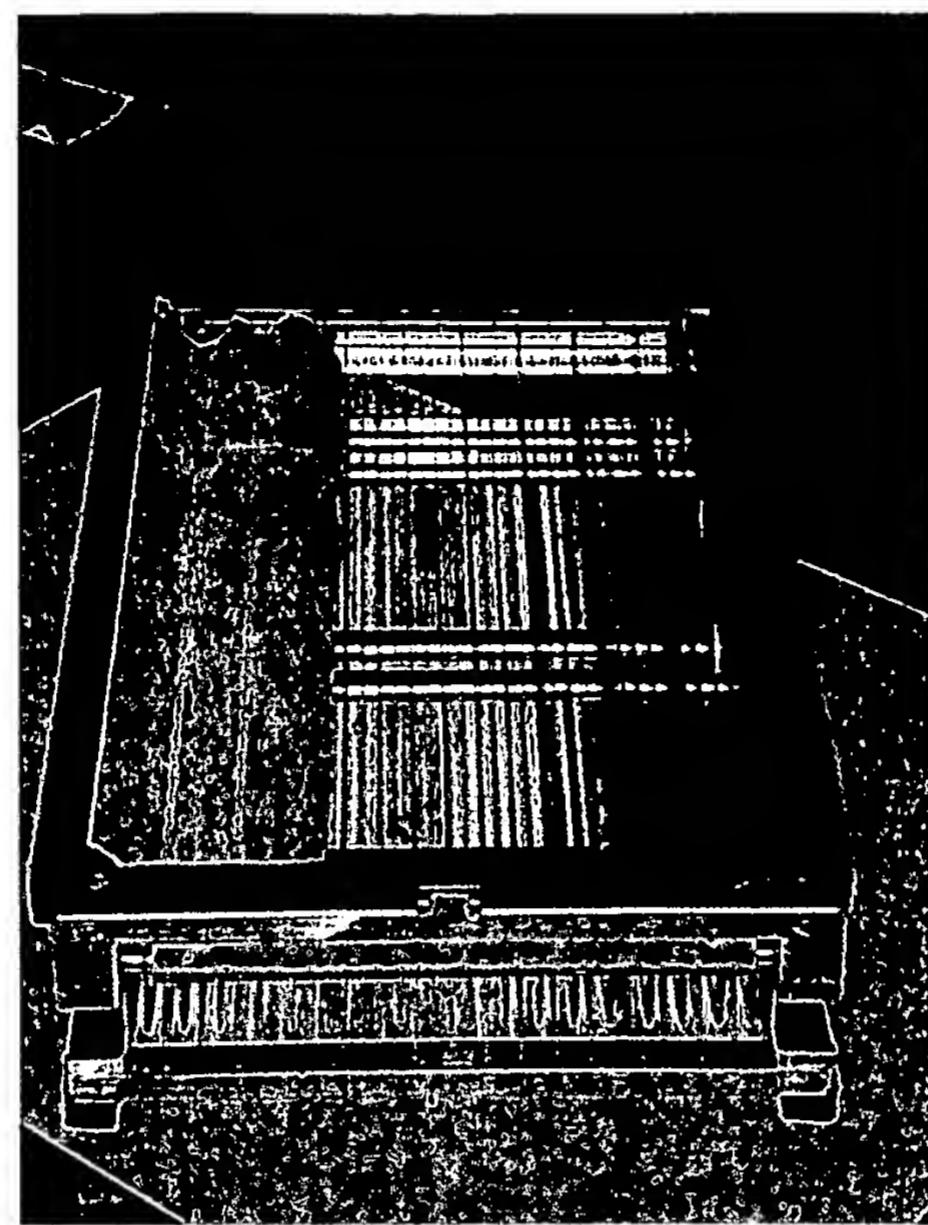


photo A

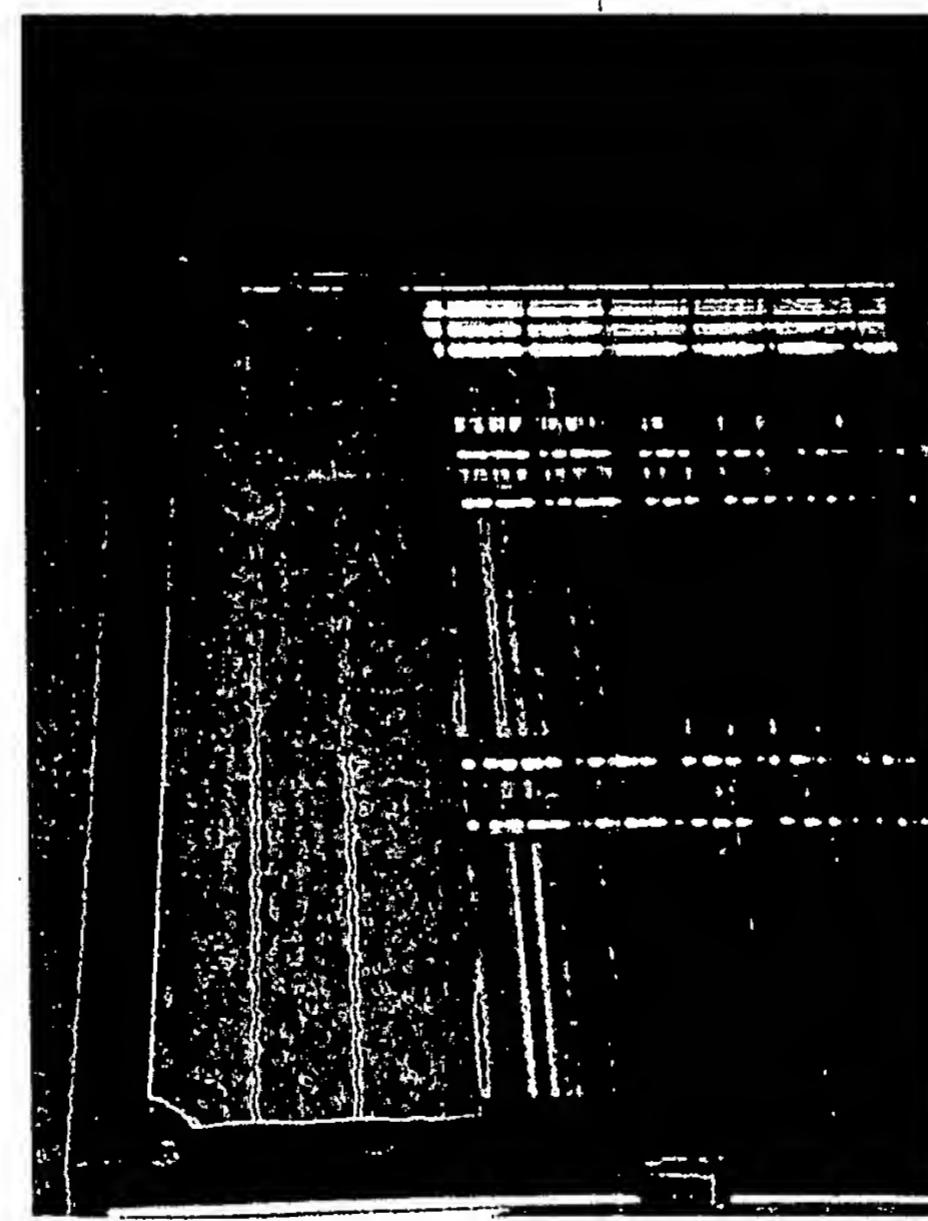


photo B

PHOTOGRAPHS OF COLLECTOR CELLS FROM TRION'S CONSOLE 250

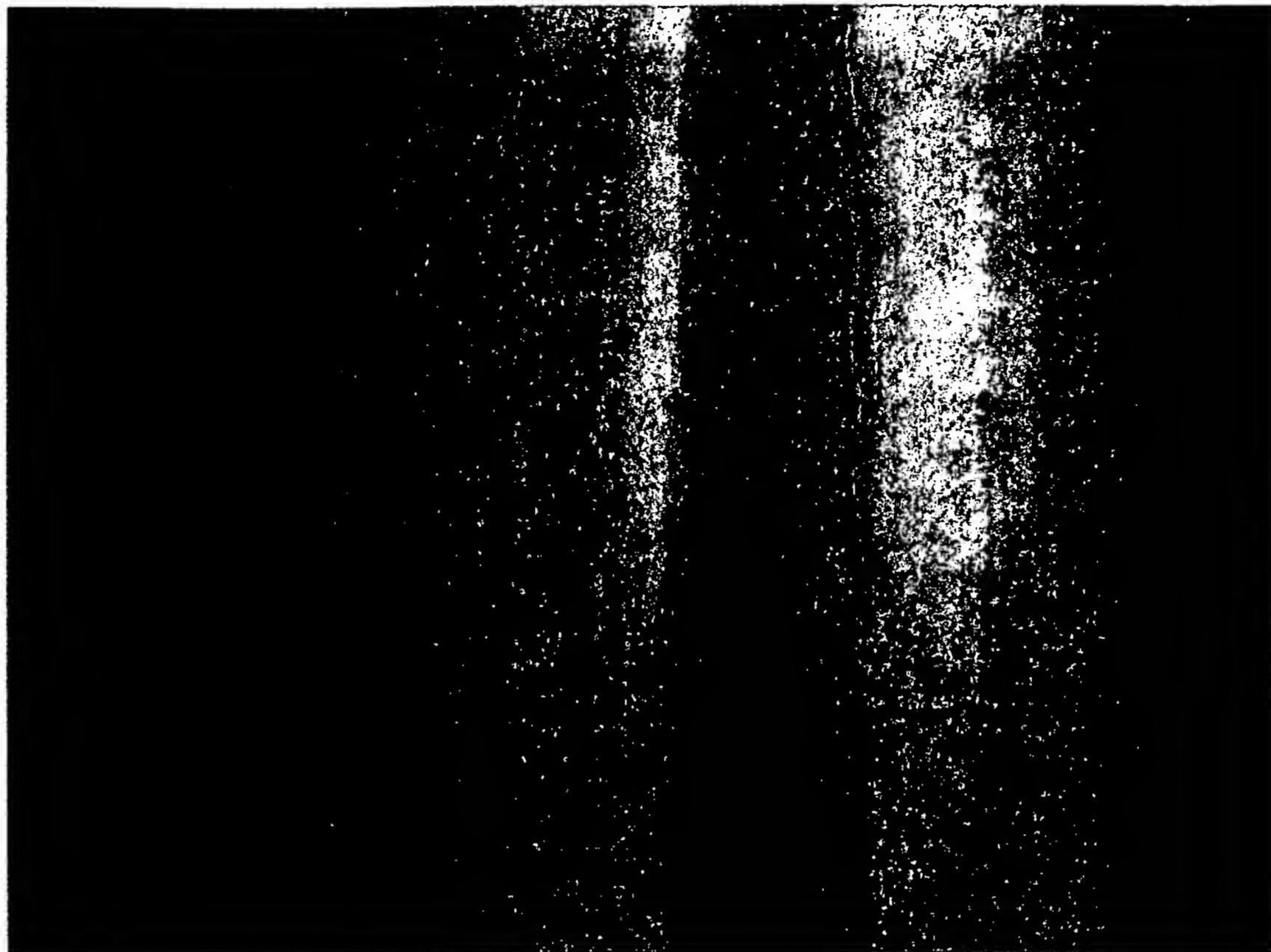


photo C

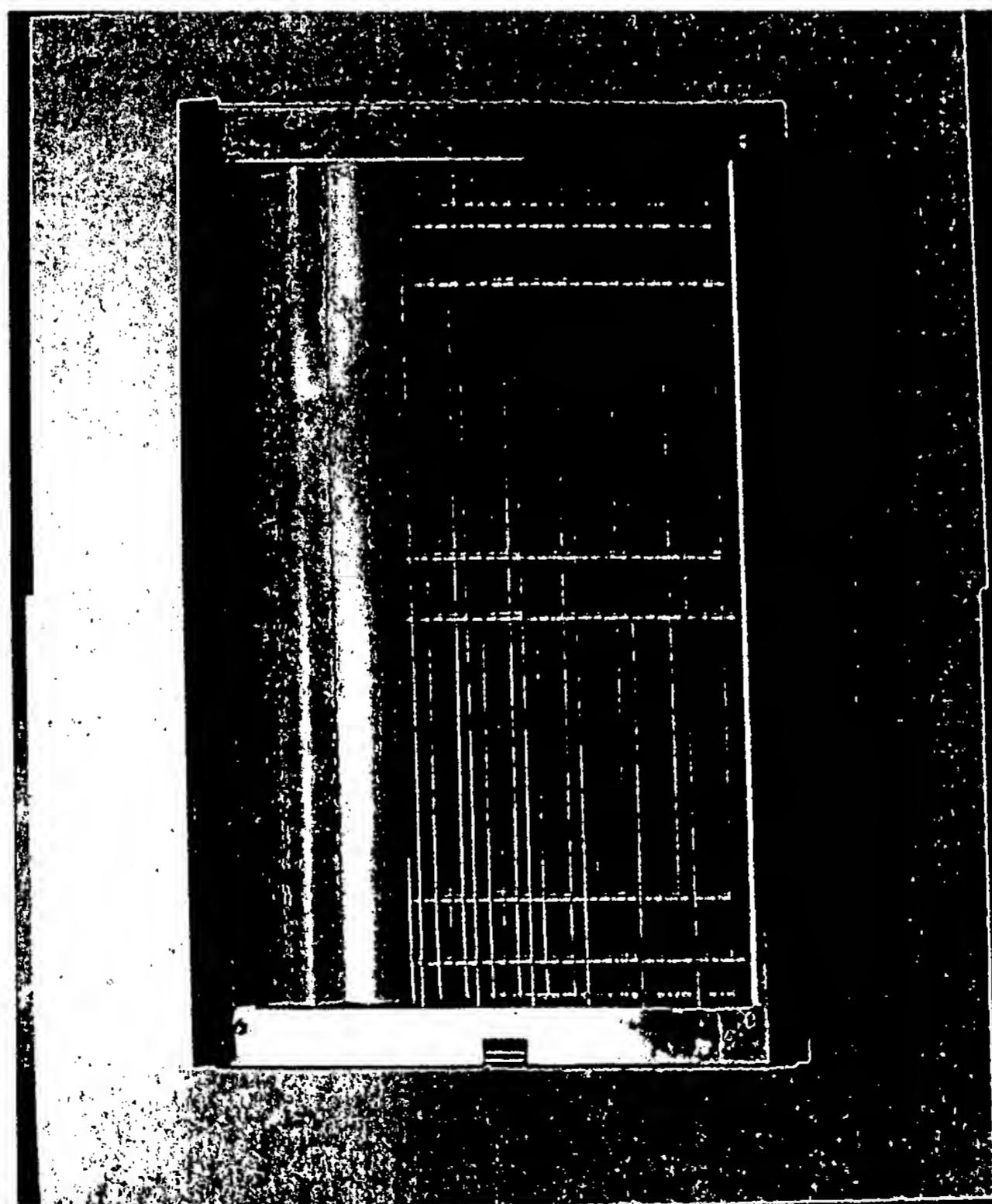


photo D

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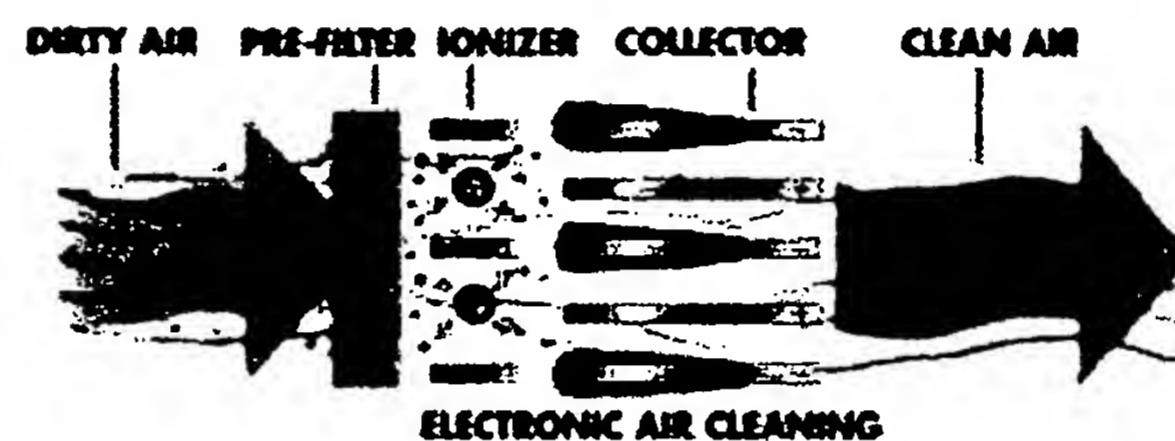
When it comes to Trion's reputation for quality and reliability, consider this: Trion is the sole supplier of air cleaning equipment to the US Navy's fleet of nuclear submarines.

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**How Trion's Electronic  
Air Cleaning Works****Features:**

Operating Speeds	3
Air Flow cfm	Low: 125 Med: 150 High: 260
Input Volt	120/60
Power consumption	166 watts
Dimensions	Length: 12" Width: 12" Height: 26.25"
Weight lbs	39
Pre filter	Aluminum mesh
After filter	Charcoal
UL/CUL listed	yes
Cabinet	Black/Gray
Cleaning area	15.5 x 20
6 Air Changes/Hour Clean Air Delivery Rate	62
Clean air indicator	yes

### **Customer Reviews**

Write an online review for this product.

#### **★★★★ Outstanding quality product**

Reviewer: Steve from Camdem, South Carolina February 17, 2000

The Trion 250 has lived up to my expectations. It performs very well, and in the near future, I am going to purchase the whole house unit for the heating system. I work in a bar/restaurant, and we have two of the commercial units there. They perform very well in removing the smoke and other airborne pollutants from the building.

#### **★★★★ Excellent product- excellent results, easy to maintain**

Reviewer: Richard St.Clair from Philadelphia, PA February 26, 2000

The Trion has amazing results, especially on cleaning the air of stale cigarette smoke, the unit is also easy to clean.

#### **★★★★ Does a great job**

Reviewer: David Warren from Newaygo, MI February 20, 2000

I am amazed at the amount of dirt absorbed by the filter. I am disappointed in the quality of the prefilter, and the unit is a lot louder than I would think something this size needs to be. The filter is a little difficult to get clean.

#### **★★★★ Very efficient at cleaning the air**

Reviewer: Terry Francik from Jacksonville, Florida March 1, 2000

I like how easy it is to clean the collector and that it does a very good job of removing airborne particles.

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